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EXAMINER

SWICKHAMER, CHRISTOPHER M

ART UNIT	PAPER NUMBER
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2697

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DATE MAILED: 05/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/524,725

Applicant(s)

GARAKANI, MEHRYAR

Examiner

Christopher M Swickhamer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: In figure 4, interface 303 is not shown on router 301. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: On page 11, line 3, the port 322 should be changed to port 332 to agree with the LAN switch as shown in figure 4. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4, 12-17, and 25-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Bare (USP 6,493). Referring to Claim 1, Bare discloses a method for determining a logical path in a managed network between a source device and a destination device at a data link layer (Fig.

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29, col. 6, lns. 20-40, col. 8, lns. 25-50), the method comprising the computer-implemented steps of creating and storing a load balance domain (Connected Group Space) representation of network devices based on a topology space representation of the network devices; identifying a least cost path (optimized path) in the load balance domain (Connected Group Space) representation; transforming the lowest costs (optimized) path into the selected path in the topology based on cost (topology space) representation; and creating and storing the lowest cost (optimized) path that was selected (transformed) based on costs between devices in the topology (into the topology space representation) as the data link layer path (col. 6, lns. 30-col. 7, lns. 26, col. 8, lns. 25-50). The load balance domain is the list of possible nodes and links for the data to traverse, and the topology space representation would be the restricted set of nodes and links that represent the lowest cost paths.

- Referring to Claim 2, Bare discloses the method as recited in Claim 1, wherein the managed network is a managed IP network (col. 74, lns. 55-68).

- Referring to Claim 3, Bare discloses the method as recited in Claim 1, wherein the step of creating and storing a load balance domain (Connected Group Space) representation further comprises the steps of identifying a set of load balance (Connected Group) nodes associated with the load balance domain (Connected Group Space) representation; identifying (Connected Group) links that connect the load balance domain (Connected Group) nodes; and creating and storing information in a forwarding table that represents the (Connected Group) links (col. 53, lns. 35-68).

- Referring to Claim 4, Bare discloses the method as recited in Claim 1, wherein the step of creating and storing a load balance domain (Connected Group Space) representation further

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comprises the steps of identifying a subnet, such as a VLAN, associated with the source device and the destination device (col. 10, lns. 48-56, col. 56, lns. 29-35); determining a set of network links that link one or more network devices in the managed network; and determining an assignment of ports of network devices (col. 10, lns. 30-col. 11, lns. 15, col. 11, lns. 64-col. 12, lns. 11).

- Referring to Claim 12, Bare discloses the method as recited in Claim 1, wherein the step of transforming the least cost (optimized) path into the topology space representation further comprises the steps of identifying an ordered set of load balancing domain (Connected Group) nodes associated with the optimized path; and identifying an ordered set of load balancing domain (Connected Group) links associated with the ordered set of load balancing domain (Connected Group) nodes (col. 6, lns. 20-40). The system would monitor and use the lowest cost path, thus it would inherently maintain a list of nodes and links to traverse on the optimum path.

- Referring to Claim 13, Bare discloses the method as recited in Claim 12, further comprising the steps of identifying a pair of interfaces associated with each load balancing domain (Connected Group) link in the ordered set of load balancing domain (Connected Group) nodes associated with the optimized path; and generating an ordered set of topology space links from the pairs of interfaces associated with load balancing domain (Connected Group) links (col. 6, lns. 20-40). The system would monitor and use the lowest cost path, thus it would inherently maintain a list of nodes and links to traverse on the optimum path.

- Referring to Claim 14, Bare discloses a computer-readable medium carrying one or more sequences of instructions for determining a logical path in a managed network between a source device and a destination device at a data link layer (Fig. 29, col. 6, lns. 20-37, col. 8, lns.

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25-46), wherein execution of the one or more sequences of instructions by one or more processors (Fig. 32) causes the one or more processors to perform the steps of creating and storing a load balancing domain (Connected Group Space) representation of network devices based on a topology space representation of the network devices (col. 10, Ins. 30-65); identifying an optimized path in the load balancing domain (Connected Group Space) representation based on cost (col. 11, Ins. 5-15); transforming the optimized path into the topology space representation; and creating and storing the optimized path that was transformed into the topology space representation as the data link layer path (col. 11, Ins. 64-col. 12, Ins. 11). The load balance domain is the list of possible nodes and links for the data to traverse, and the topology space representation would be the restricted set of nodes and links that represent the lowest cost paths.

- Referring to Claim 15, Bare discloses the computer-readable medium as recited in Claim 14, wherein the managed network is a managed IP network (col. 74, Ins. 55-68).

- Referring to Claim 16, Bare discloses the computer-readable medium as recited in Claim 14, wherein the step of creating and storing a load balancing domain (Connected Group Space) representation further comprises the steps of identifying a set of load balancing domain (Connected Group) nodes associated with the load balancing domain (Connected Group Space) representation; identifying load balancing domain (Connected Group) links that connect the load balancing domain (Connected Group) nodes; and creating and storing information that represents the load balancing domain (Connected Group) links (col. 14, Ins. 58-col. 15, Ins. 40).

- Referring to Claim 17, Bare discloses the computer-readable medium as recited in Claim 14, wherein the step of creating and storing a load balancing domain (Connected Group

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Space) representation further comprises the steps of identifying a subnet, such as a VLAN (Fig. 29, col. 56, lns. 29-35), associated with the source device and the destination device; determining a set of network links that link one or more network devices in the managed network; and determining an assignment of ports of network devices (col. 14, lns. 58-col. 15, lns. 40).

- Referring to Claim 25, Bare discloses the computer-readable medium as recited in Claim 14, wherein the step of transforming the optimized path into the topology space representation further comprises the steps of identifying an ordered set of load balancing domain (Connected Group) nodes associated with the optimized path; and identifying an ordered set of load balancing domain (Connected Group) links associated with the ordered set of load balancing domain (Connected Group Space) nodes (col. 11, lns. 5-15). The system is able to identify the paths with the lowest costs, and is passed between the different devices so they know over which path the data should be sent.

- Referring to Claim 26, Bare discloses the computer-readable medium as recited in Claim 25, further comprising the steps of identifying a pair of interfaces associated with each load balancing domain (Connected Group) link in the ordered set of load balancing domain (Connected Group) nodes associated with the lowest cost (optimized) path (col. 11, lns. 5-15); and generating an ordered set of topology space links from the pairs of interfaces associated with load balancing domain (Connected Group) links (col. 13, lns. 55-col. 14, lns. 50, col. 14, lns. 55-col. 15, lns. 40).

- Referring to Claim 27, Bare discloses a computer data signal embodied in a carrier wave (such as a computer chip that carries an electrical signal, Fig. 32), the computer data signal carrying one or more sequences of instructions for determining a logical path in a managed

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network between a source device and a destination device at a data link layer (col. 6, Ins. 20-40, col. 8, Ins. 25-50), wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of creating and storing a load balancing domain (Connected Group Space) representation of network devices based on a topology space representation of the network devices; identifying a least cost path (an optimized path) in the load balancing domain (Connected Group Space) representation; transforming the optimized path into the topology space representation; and creating and storing the optimized path that was transformed into the topology space representation as the data link layer path (col. 10, Ins. 30-col. 11, Ins. 15). The load balance domain is the list of all possible nodes and links for the data to traverse, and the topology space representation would be the restricted set of nodes and links that represent the lowest cost paths.

- Referring to Claim 28, Bare discloses a computer apparatus comprising: a processor; and a memory coupled to the processor, the memory containing one or more sequences of instructions for determining a logical path in a managed network between a source device and a destination device at a data link layer (Fig. 32, col. 6, Ins. 20-40, col. 8, Ins. 25-50), wherein execution of the one or more sequences of instructions by the processor causes the processor to perform the steps of creating and storing a load balancing domain (Connected Group Space) representation of network devices based on a topology space representation of the network devices; identifying a least cost (an optimized) path in the load balancing domain (Connected Group Space) representation; transforming the optimized path into the topology space representation; and creating and storing the optimized path that was transformed into the topology space representation as the data link layer path (col. 10, Ins. 30-col. 11, Ins. 15). The

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load balance domain is the list of all possible nodes and links for the data to traverse, and the topology space representation would be the restricted set of nodes and links that represent the lowest cost paths.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-9 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bare in view of McCloghrie (USP 6,304,901). Referring to Claim 5, Bare discloses the method as recited in Claim 1, wherein the step of creating and storing a load balancing domain (Connected Group Space) representation further comprises the steps of identifying all Virtual Local Area Networks (VLANs) associated with a subnet associated with the source device and the destination device (col. 23, lns. 50-62, Fig. 29, col. 56, lns. 29-35); but does not expressly disclose identifying all Emulated Local Area Networks (ELANs) associated with the subnet. McCloghrie discloses a system where VLANs and ELANs are coupled to one another (col. 1, lns. 20-65). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the system of Bare that identifies multiple VLANs, to also be coupled to and to identify ELANs so that the links could be optimized over both ELANs and VLANs. One of ordinary skill in the art would have been motivated to do this since Emulated LANs are an accepted VLAN technology (col. 1, lns. 30-35).

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- Referring to Claim 6, Bare discloses the method as recited in Claim 1, wherein the step of creating and storing a load balance domain (Connected Group Space) representation further comprises the steps of creating one load balance domain (Connected Group) node for any pairs of interfaces across a point-to-point link in the topology space representation; creating one load balance domain (Connected Group) node for any interfaces of the managed network that are directly connected by virtue of being on a same physical medium; creating one load balance domain (Connected Group) node for each internal interface of any network device when the network device has an internal interface; creating one load balance domain (Connected Group) node for the source device; creating one load balance domain (Connected Group) node for the destination device; and creating one load balance domain (Connected Group) node for each user interface on any network device when the network device has a user interface (Fig. 1, col. 13, lns. 55-col. 14, lns. 50, col. 14, lns. 58-col. 15, lns. 40, Fig. 29, col. 54, lns. 5-20). Bare does not expressly disclose creating one load balance domain (Connected Group) node for LAN Emulation interfaces on a same Emulated Local Area Network (ELAN). McCloghrie discloses a system where VLANs and ELANs are coupled to one another (col. 1, lns. 20-65). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the system of Bare that is able to identify multiple VLANs (col. 56, lns. 29-35), to also be coupled to ELANs and be able to identify the ELANS so that the links could be optimized over both ELANs and VLANs. One of ordinary skill in the art would have been motivated to do this since Emulated LANs are an accepted VLAN technology (col. 1, lns. 30-35).

- Referring to Claim 7, Bare discloses the method as recited in Claim 6, further comprising the step of determining load balancing domain (Connected Group) links between

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load balancing domain (Connected Group) nodes in a subnet associated with the source device and the destination device (col. 14, Ins. 58-col. 15, Ins. 40).

- Referring to Claim 8, Bare discloses the method as recited in Claim 7, further comprising the step of creating one load balancing domain (Connected Group) link for each pair of interfaces within each network device, wherein each interface is associated with the subnet of the source device and the destination device and is in a forwarding state (col. 13, Ins. 55-col. 14, Ins. 7).

- Referring to Claim 9, Bare discloses the method as recited in Claim 8, further comprising the step of checking a spanning tree status for each interface within each network device to determine whether the interface is in the forwarding state (col. 4, Ins. 25-51, col. 11, Ins. 1-5).

- Referring to Claim 18, Bare discloses the computer-readable medium as recited in Claim 14, wherein the step of creating and storing a Connected Group Space representation further comprises the steps of identifying all Virtual Local Area Networks (VLANs) associated with a subnet associated with the source device and the destination device (Fig. 29, col. 56, Ins. 29-35); but does not expressly disclose identifying all Emulated Local Area Networks (ELANs) associated with the subnet associated with the source device and the destination device.

McCloghrie discloses a system where VLANs and ELANs are coupled to one another (col. 1, Ins. 20-65). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the system of Bare that is able to identify multiple VLANs, to also be coupled to ELANs and be able to identify the ELANs so that the links could be optimized over

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both ELANs and VLANs. One of ordinary skill in the art would have been motivated to do this since Emulated LANs are an accepted VLAN technology (col. 1, lns. 30-35).

- Referring to Claim 19, Bare discloses the computer-readable medium as recited in Claim 14, wherein the step of creating and storing a load balancing domain (Connected Group Space) representation further comprises the steps of creating one load balancing domain (Connected Group) node for any pairs of interfaces across a point-to-point link in the topology space representation; creating one load balancing domain (Connected Group) node for any interfaces of the managed network that are directly connected by virtue of being on a same physical medium; creating one load balancing domain (Connected Group) node for each internal interface of any network device when the network device has an internal interface; creating one load balancing domain (Connected Group) node for the source device; creating one load balancing domain (Connected Group) node for the destination device; and creating one load balancing domain (Connected Group) node for each user interface on any network device when the network device has a user interface (Fig. 29, col. 12, lns. 1-11, col. 14, lns. 55-col. 15, lns. 40), but does not expressly disclose creating one load balancing domain (Connected Group) node for LAN Emulation interfaces on a same Emulated Local Area Network (ELAN). McCloghrie discloses a system where VLANs and ELANs are coupled to one another (col. 1, lns. 20-65). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the system of Bare that is able to identify multiple VLANs, to also be coupled to ELANs and be able to identify the ELANs as nodes in the system so that the links could be optimized over both ELANs and VLANs. One of ordinary skill in the art would have been

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motivated to do this since Emulated LANs are an accepted VLAN technology (col. 1, lns. 30-35).

- Referring to Claim 20, Bare discloses the computer-readable medium as recited in Claim 19, further comprising the step of determining load balancing domain (Connected Group) links between load balancing domain (Connected Group) nodes in a subnet, such as a VLAN, associated with the source device and the destination device (Fig. 29, col. 10, lns. 30-65, col. 14, lns. 55-col. 15, lns. 60).

- Referring to Claim 21, Bare discloses the computer-readable medium as recited in Claim 20, further comprising the step of creating one load balancing domain (Connected Group) link for each pair of interfaces within each network device, wherein each interface is associated with the subnet of the source device and the destination device, and is in a forwarding state (col. 13, lns. 55-col. 14, lns. 10).

- Referring to Claim 22, Bare discloses the computer-readable medium as recited in Claim 21, further comprising the step of checking a spanning tree status for each interface within each network device to determine whether the interface is in the forwarding state (col. 10, lns. 60-65, col. 13, lns. 55-col. 14, lns. 10).

7. Claims 10-11 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bare in view of Huang (USP 6,301,244). Referring to Claim 10, Bare discloses the method as recited in Claim 1, wherein the step of identifying an optimized path in the load balancing domain (Connected Group Space) representation further comprises the step of finding the lowest cost in terms of latency and throughput (shortest path) between a load balancing domain (Connected Group Space) source node and a load balancing domain (Connected Group Space)

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destination node (col. 11, lns. 5-15), but does not expressly disclose optimizing based on shortest path. Huang discloses a system the selects the shortest path through a communications network (abstract). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add the ability to optimize the path found by the system of Bare to choose the shortest path across the network. One of ordinary skill in the art would have been motivated to do this since choosing a shorter path can improve latency, which would be important in time sensitive data transfer, such as video or voice over data network systems (col. 1, lns. 15-50).

- Referring to Claim 11, Bare discloses the method as recited in Claim 10, but does not expressly disclose further comprising the step of using a Dijkstra algorithm to find the shortest path between the Connected Group source node and the Connected Group destination node. Huang discloses a system the selects the shortest path through a communication network using the Dijkstra algorithm (abstract). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add the ability to optimize the path found by the system of Bare to use the Dijkstra algorithm to select the shortest path across the network. One of ordinary skill in the art would have been motivated to do this since the Dijkstra algorithm is a well-known method for choosing the shortest path. Choosing a shorter path can improve latency, which would be important in time sensitive data transfer, such as video or voice over data network systems (col. 1, lns. 15-50).

- Referring to Claim 23, Bare discloses the computer-readable medium as recited in Claim 14, wherein the step of identifying a least cost (an optimized) path in the load balancing domain (Connected Group Space) representation further comprises the step of finding a least cost (shortest) path between a load balancing domain (Connected Group) source node and a load

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balancing domain (Connected Group) destination node (col. 11, lns. 5-15). Bare does not expressly disclose using the shortest path as the optimized path. Huang discloses a system the selects the shortest path through a communications network (abstract). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add the ability to optimize the path found by the system of Bare to choose the shortest path across the network. One of ordinary skill in the art would have been motivated to do this since choosing a shorter path can improve latency, which would be important in time sensitive data transfer, such as video or voice over data networks (col. 1, lns. 15-50).

- Referring to Claim 24, Bare discloses the computer-readable medium as recited in Claim 23, further comprising the step of using a Dijkstra algorithm to find the shortest path between the load balancing domain (Connected Group) source node and the load balancing domain (Connected Group) destination node. Huang discloses a system the selects the shortest path through a communication network using the Dijkstra algorithm (abstract). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add the ability to optimize the path found by the system of Bare to use the Dijkstra algorithm to select the shortest path across the network. One of ordinary skill in the art would have been motivated to do this since the Dijkstra algorithm is a well-known method for choosing the shortest path. Choosing a shorter path can improve latency, which would be important in time sensitive data transfer, such as video or voice over data networks (col. 1, lns. 15-50).

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Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Oguchi et al, USP 6,304,912. *Process and apparatus for speeding-up layer-2 and layer-3 routing, and for determining layer-2 reachability, through a plurality of subnetworks.*
- Wang et al, USP 6,538,977. *Layer-2 trace method and node.*
- Pegrum et al, USP 6,490,244. *Layer 3 routing in self-healing networks.*
- Cox et al, USP 6,172,981. *Method and system for distributing network routing functions to local area network stations.*
- Busche, USP 5,805,953. *Routing method for setting up a service between an origination node and a destination node in a connection-communications network.*

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M Swickhamer whose telephone number is (703) 306.4820. The examiner can normally be reached on 8:00-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (703) 305.4798. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872.9314 for regular communications and (703) 872.9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305.3900.

CMS
April 29, 2003


RICKY NGO
PRIMARY EXAMINER